

WHAT IS CLAIMED IS:

1. An apparatus for testing a leakage protection reliability of an integrated circuit interconnection, comprising:

5 a first comb-like pattern having one straight length portion and a plurality of tooth portions protruding from the length portion substantially parallel with one another and having substantially the same lengths;

one serpentine-like pattern comprising a plurality of unit parts and at least one connection part;

10 wherein each of the unit parts includes:

two tooth parallel parts laterally spaced apart from the neighboring tooth portions by a certain distance, and extending substantially parallel therewith,

a length parallel part formed at a level different from the level of the comb-like pattern and connecting the ends of the two tooth parallel parts and forming turning points
15 with the tooth parallel parts, and

two vias connecting the ends of the two tooth parallel parts with the both ends of the length parallel part through an interlayer dielectric layer and spaced apart from the end of the neighboring tooth portion by a minimum design length according to a design rule;

wherein the connection part connects the ends of the neighboring two tooth parallel
20 parts for connecting the two unit parts; and

a second comb-like pattern having the same components as the first comb-like pattern and disposed at an opposite position from the first comb-like pattern, wherein:

the end of the tooth portion of the additional comb-like pattern is located at the central position between the two tooth portions of the comb-like pattern under the connection part,

25 and laterally spaced from the neighboring two vias by the minimum design length; and

means for applying a defined bias voltage between the first and second comb-like patterns and the serpentine-like pattern to generate a potential difference between the patterns.

30 2. The apparatus as claimed in claim 1, wherein:

the end of the tooth portion of the second comb-like pattern is located within the minimum design length deviation from the connection part connecting the two vias formed at the ends of the tooth parallel parts; and

the connection part is laterally spaced apart from the neighboring length portion at least by the minimum design length in a top plan view.

3. The apparatus as claimed in claim 1, wherein the first and second comb-like patterns are different in length and width of the tooth portion from at least one of the length of the tooth portion and the width of the tooth portion.

4. The apparatus as claimed in claim 1, wherein the length parallel part has a length different from the length of the connection part.

5. An apparatus for testing a leakage protection reliability of an integrated circuit interconnection, comprising:

a pair of comb-like patterns, wherein each of the comb-like patterns has one straight length portion and a plurality of tooth portions, and wherein the pair of patterns face each other,

a serpentine-like pattern comprising tooth parallel parts, first length parallel parts, second length parallel parts, and vias; and

means of applying a defined bias voltage at the comb-like pattern and the serpentine-like pattern to generate a potential difference between the two patterns,

wherein the tooth portions having the same lengths protrude from the length portion, substantially parallel with one another, running substantially parallel with and interleaving with the neighboring tooth portions of the other comb-like pattern;

wherein the tooth parallel parts are formed at the same level with the pair of the comb-like patterns, spaced apart from the neighboring tooth portions by a defined distance and extending substantially parallel therewith;

the first length parallel part is present at a level spaced from the level of the comb-like patterns by an interlayer dielectric layer and connecting the ends of the two tooth parallel parts adjacent to the comb-like pattern in the left or right side of the serpentine-like pattern;

the second length parallel part is present at a level spaced from the level of the comb-like patterns by an interlayer dielectric layer and connecting the ends of the two tooth parallel parts adjacent to the comb-like pattern in the right or left side of the serpentine-like pattern; and

the vias connect the ends of the first and second length parallel parts with the both ends of the tooth parallel part through an interlayer dielectric layer at the both ends of the tooth parallel part.

5 6. An apparatus for testing a leakage protection reliability of an integrated circuit interconnection, comprising:

 a first and a second interleaved comb pattern;

 a three-dimensional serpentine pattern including:

 tooth parallel parts integrated between the comb patterns in a first level layer,

10 connection parts traversing the tooth parallel parts in a second level layer, and

 vias connecting the tooth parallel parts to the connection parts; and

 a bias voltage generator structured to apply a bias voltage to the comb patterns and to the serpentine pattern.

15 7. The apparatus of claim 6 wherein the tooth parallel parts of the serpentine pattern are substantially parallel with one another.

 8. The apparatus of claim 7 wherein the tooth parallel parts of the serpentine pattern run substantially parallel to and interleave with the comb patterns.

20 9. The apparatus of claim 8 wherein the tooth parallel parts of the serpentine pattern are spaced apart by a minimum design rule length from the comb patterns.

 10. The apparatus of claim 6 wherein the first and second comb patterns have
25 different sizes.

 11. The apparatus of claim 6, further comprising an inter layer dielectric layer formed between the first level layer and the second level layer.

30 12. The apparatus of claim 11 wherein the vias are formed within the inter layer dielectric layer.